#10 Dash 8-2003

Docket No. AUS9-2000-0316-US1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Arndt et al.** §

Serial No. **09/631,723** §

Filed: **August 3, 2000** §

For: **Permanent Open Firmware PCI Host Bridge (PHB) Unit Addressing to Support Dynamic Memory Mapping and Swapping of I/O Drawers** §

Group Art Unit: **2189**

Examiner: **Lee, Christopher E.**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ATTENTION: Board of Patent Appeals and Interferences

Certificate of Mailing Under 37 C.F.R. § 1.8(a)
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By: Rebecca Clayton
Rebecca Clayton

APPELLANT'S BRIEF (37 C.F.R. 1.192)

This brief is in furtherance of the Notice of Appeal, filed in this case on June 5, 2003.

The fees required under § 1.17(c), and any required petition for extension of time for filing this brief and fees therefore, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is transmitted in triplicate. (37 C.F.R. 1.192(a))

REAL PARTIES IN INTEREST

The real party in interest in this appeal is the following party: International Business Machines Corporation.

RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interference's that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, there are no such appeals or interference's.

STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application are: Claims 1-21

B. STATUS OF ALL THE CLAIMS IN APPLICATION

1. Claims canceled: None
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: Claims 1-21
4. Claims allowed: None
5. Claims rejected: Claims 1-21

C. CLAIMS ON APPEAL

The claims on appeal are: Claims 1-21

STATUS OF AMENDMENTS

A Response to Final Office Action was filed by Appellants on 04/22/2003, and was indicated as being entered by the Examiner in an Advisory Action dated 04/30/2003. No amendments were made to any claims in this Response to Final Office Action.

SUMMARY OF INVENTION

A method, system and computer program product for managing input/output drawers within a data processing system. The input/output drawers are modular structures that contain input/output or other types of electrical, electronic or mechanical devices typically used in a data processing system. A unique identifier is assigned to each of the plurality of input/output drawers, and is used by the operating system to identify the plurality of input/output drawers. This unique identifier does not change when reconfiguring at least one of the input/output drawers within the data processing system, and therefore the unique identifier that is used by the operating system to identify each of the drawers in the data processing system remains the same regardless of how the input/output drawers are interconnected by cables. This provides a degree of hardware interconnect transparency to the operating system, such that the operating system and associated software applications do not have to change or update how they access these drawers even when the drawer interconnection gets modified such as by adding a new drawer or removing an existing drawer.

Referring to Appellants' Figure 3, there is shown a plurality of I/O drawers 304, 306 and 308. There I/O drawers are modular structures that are easy to install and remove, allowing for easy modification of the data processing system (Col. 2, lines 10-14). These drawers are interconnected by high-speed cables to form the overall data processing system (Specification Col. 2, line 27 – Col. 3, line 7; this cable interconnection of drawers is also shown on the front cover of the cited Ahren's patent). In the preferred embodiment, service processor 302 assigns a unique identification to each of the I/O drawers within the system (Specification page 14, lines 3-6). System firmware 326 dynamically discovers the I/O drawers and assigns memory mapping to each one of the drawers and their associated PCI Host Bridges (PHB) 310-320 using these uniquely assigned identifiers (Specification page 15, lines 1-6). Since the unique identifier is permanently associated with and maintained by service processor 302 in NVRAM 322, access to devices contained with the drawers

by the operating system and associated software applications such as Object Data Management (ODM) remains the same irrespective of how the drawers are interconnected together (Specification page 15, line 27 – page 16, line 3). For example, if one of the I/O drawers is moved to a different physical location within the system, no action is required on the part of the user for system reconfiguration (Specification page 16, line 13-24).

ISSUES

I. Whether the rejection of Claims 1-21 under 35 U.S.C. 103(a) is proper.

GROUPING OF CLAIMS

Claims 1-21 stand or fall together, and thus there is a single group of claims as defined below:

Group I Claims 1-21

ARGUMENT

The Examiner rejected Claims 1, 3, 8, 10, 15 and 17 under 35 U.S.C. § 103 as being unpatentable over Ahrens et al. (US 6,230,265 B1) in view of Berglund et al. (US 6,044,411). The Examiner acknowledges that Ahrens doesn't teach assigning or storing a unique identifier to each of the plurality of input/output drawers, but states that Berglund teaches these steps. Applicants show error in this rejection as follows.

Regarding Group I, and in particular Claim 1, such claim recites assigning a unique identifier to each of the plurality of input/output drawers "wherein the unique identifier is used by an operating system to identify the plurality if input/output drawers regardless of how the input output drawers are interconnected by cables". None of the cited references teach or suggest this claimed feature, which addresses a problem of system configuration when drawers are inserted, removed or rearranged (Specification page 3, line 17 – page 4, line 1). Since the drawers are identified by the operating system regardless of how the drawers are interconnected by cable, drawers can be inserted, removed or rearranged in an operating system-transparent fashion.

The Examiner states that this claimed feature is implicit in the teachings of Berglund. Applicants show that, to the contrary, Berglund teaches that his addresses are composed using the *actual physical locations* of its components, in order to enhance the ability to locate the physical location of a device (Berglund Col. 2, lines 49-53, Col. 4, lines 22-24 and lines 37-52). As described at Berglund Col. 7, lines 12-39, when the system is turned on, the SPCN writes *unique physical location addresses* into the respective memory, specifying the associated enclosure and the particular backplane. The operating system reads the enclosure/backplane physical location address information when building a mapping of logical addresses to physical location addresses (Bergland Col. 7, lines 49-56). Thus, it is shown that since Berglund uses actual physical device location information when constructing its logical address mapping, the addresses used when accessing a device *do change* when the device is re-cabled to be at another physical location within the system, since the physical address used to access the device is comprised of its physical enclosure/tower location information (Col. 4, lines 40-43) which would change when the device is re-cabled. See, in particular, Bergland's discussion at Col. 8, lines 42-52, where Bergland describes this exact scenario (and reproduced herein):

> "In some systems, such as those having multiple buses, it is advantageous to store bus identification information in non-volatile memory (NVRAM) associated with the backplane. In this way, *should an enclosure be removed and relocated at a different position on the main bus*, that is, be at a different logical bus "drop" point, a unique bus identifier persists in the NVRAM, so that system bus configuration information can be maintained *and updated* in the operating system and NVRAM. (emphasis added by Appellants)

This is in contrast to the claimed invention, where techniques for identifying or accessing devices contained within the drawers *do not change* when the drawers are relocated to a different position on the system bus by re-cabling, since a unique identifier is used by the operating system to identify the drawers regardless of how the input/output drawers are interconnected by cable.

In rejecting claims under 35 U.S.C. Section 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Only if that burden is met, does the burden of coming forward with evidence or argument shift to the applicant. Id. To establish prima facie obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. MPEP 2143.03. *See also,* In re Royka, 490 F.2d 580 (C.C.P.A. 1974). As Applicants have established above that all the claim limitations are not taught or suggested by the cited art, Applicants have similarly established that the Examiner has failed to establish a prima facie showing of obviousness. If the examiner fails to establish a prima facie case, the rejection is improper and will be overturned. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Therefore, Applicants respectfully request that this rejection be overturned as a prima facie case of obviousness has not been established.

Appellants further show that it would not have been obvious to modify the teachings of Berglund in accordance with the claimed invention, due to Berglund's expressed desire of providing a system where the physical address location information used for identifying devices by the operating system do change when a device is relocated to a different position such as by re-cabling, so that it is easier to locate the device for serviceability (Berglund Col. 4, lines 30-52).

Accordingly, it is requested that the Examiner's rejection of Claims 1-21 under 35 U.S.C. § 103 be reversed by the Board.

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APPENDIX OF CLAIMS

The text of the claims involved in the appeal are:

1. A method of managing input/output drawers within a data processing system, the method comprising:

assigning a unique identifier to each of a plurality of input/output drawers; and

storing the unique identifier in memory;

wherein the unique identifier is used by an operating system to identify the plurality of input/output drawers regardless of how the input/output drawers are interconnected by cables, such that addresses used when accessing devices contained within said plurality of input/output drawers do not change when reconfiguring at least one of the input/output drawers within the data processing system.

2. The method as recited in claim 1, further comprising:

responsive to a determination that a new input/output drawer has been added to the data processing system, assigning a new unique identifier to the new input/output drawer, wherein the new unique identifier is different from any of the unique identifiers previously assigned, such that each of the plurality of input/output drawers maintains the same unique identifier.

3. The method as recited in claim 1, wherein the method is performed in a service processor.

4. The method as recited in claim 2, wherein the unique identifier and the new unique identifier are stored in a device tree.

5. The method as recited in claim 2, wherein the unique identifier comprise device nodes and location codes.

6. The method as recited in claim 4, wherein the device tree is stored in a system memory.

7. The method as recited in claim 2, further comprising:

updating a device tree to reflect a configuration of the data processing system after inclusion of the new input/output drawer.

8. A computer program product in a computer readable media for use in a data processing system for managing input/output drawers within the data processing system, the computer program product comprising:

first instructions for assigning a unique identifier to each of a plurality of input/output drawers; and

second instructions for storing the unique identifier in memory;

wherein the unique identifier is used by an operating system to identify the plurality of input/output drawers regardless of how the input/output drawers are interconnected by cables, such that addresses used when accessing devices contained within said plurality of input/output drawers do not change when reconfiguring at least one of the input/output drawers within the data processing system.

9. The computer program product as recited in claim 8, further comprising:

third instructions, responsive to a determination that a new input/output drawer has been added to the data processing system, for assigning a new unique identifier to the new input/output drawer, wherein the new unique identifier is different from any of the unique identifiers previously assigned, such that each of the plurality of input/output drawers maintains the same unique identifier.

10. The computer program product as recited in claim 8, wherein said first and second instructions are executed in a service processor.

11. The computer program product as recited in claim 9, wherein the unique identifier and the new unique identifier are stored in a device tree.

12. The computer program product as recited in claim 9, wherein the unique identifier comprise device nodes and location codes.

13. The computer program product as recited in claim 11, wherein the device tree is stored in a system memory.

14. The computer program product as recited in claim 9, further comprising:

fourth instructions for updating a device tree to reflect a configuration of the data processing system after inclusion of the new input/output drawer.

15. A system for managing input/output drawers within a data processing system, the system comprising:

first means for assigning a unique identifier to each of a plurality of input/output drawers; and

second means for storing the unique identifier in memory;

wherein the unique identifier is used by an operating system to identify the plurality of input/output drawers regardless of how the input/output drawers are interconnected by cables, such that addresses used when accessing devices contained within said plurality of input/output drawers do not change when reconfiguring at least one of the input/output drawers within the data processing system.

16. The system as recited in claim 15, further comprising:

third means, responsive to a determination that a new input/output drawer has been added to the data processing system, for assigning a new unique identifier to the new input/output drawer, wherein the new unique identifier is different from any of the unique identifiers previously assigned, such that each of the plurality of input/output drawers maintains the same unique identifier.

17. The system as recited in claim 15, wherein said first and second means are executed in a service processor.

18. The system as recited in claim 16, wherein the unique identifier and the new unique identifier are stored in a device tree.

19. The system as recited in claim 16, wherein the unique identifier comprise device nodes and location codes.

20. The system as recited in claim 18, wherein the device tree is stored in a system memory.

21. The system as recited in claim 16, further comprising:

fourth means for updating a device tree to reflect a configuration of the data processing system after inclusion of the new input/output drawer.